

CHRONIC AQUATIC TOXICITY TEST REPORT



New England Bioassay
a Division of GZA GeoEnvironmental, Inc.

77 Batson Drive
Manchester, CT
06042
860-643-9560
FAX 860-646-7169

Specialty Minerals, Inc
Adams, MA
NPDES Permit: MA0005991
Receiving Water: Hoosic River

Test Start Date: May 16, 2016

Test Period: May 2016

Report Prepared by:

New England Bioassay
A Division of GZA GeoEnvironmental, Inc.
77 Batson Dr.
Manchester, CT 06042

NEB Project Number: 05.0044739.00

Report Date: June 9, 2016

Report Submitted to:

Specialty Minerals, Inc
260 Columbia St.
Adams, MA 01220

Sample ID: Effluent

Please contact the Lab Manager, Kim Wills, at (860) 858-3153 or kimberly.wills@gza.com
if you have any questions concerning these results.

NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET
Facility Name: Specialty Minerals, Inc Test Start Date: 5/16/16
NPDES Permit Number: MA0005991 Pipe Number: _____

Test Type	Test Species	Sample Type	Sample Method
<input type="checkbox"/> Acute	<input type="checkbox"/> Fathead Minnow	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> Ceriodaphnia	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> X Composite
<input checked="" type="checkbox"/> Modified (chronic reporting acute values)	<input type="checkbox"/> Daphnia Pulex	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flowthru
<input type="checkbox"/> 24hr screening	<input type="checkbox"/> Mysid Shrimp	<input type="checkbox"/> Chlorinated on site	<input type="checkbox"/> Other
	<input type="checkbox"/> Sheepshead	<input type="checkbox"/> X Unchlorinated	
	<input type="checkbox"/> Menidia		
	<input type="checkbox"/> Sea Urchin	TRC conc. <u>0.008</u> mg/L	
	<input type="checkbox"/> Champia		
	<input type="checkbox"/> Selenastrum		
	<input type="checkbox"/> Other _____		

Dilution Water

- receiving water collected at a point upstream of or away from the discharge, free from toxicity or other sources of contamination; (Receiving water name: Hoosic River)
 alternate surface water of known quality and a hardness, etc. to generally reflect the characteristics of the receiving water; (Surface water name: _____)
 synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;
 or artificial sea salts mixed with deionized water;
 deionized water and hypersaline brine; or
 other _____

Effluent sampling date (s): 5/15-16/16 5/17-18/16 5/19-20/16

Effluent concentrations tested (in%): 0 6.25 12.5 25 27.17 50 100

* Permit limit concentration: 27.17%

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 5/2/16 Reference Toxicant Test Acceptable: Yes No

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS & PERMIT LIMITS
Test Acceptability Criteria

A. Synthetic Water Control

Mean Control Survival: 100% Mean Control Reproduction: 34.2 young/female

B. Receiving Water Control

Mean Control Survival: 100% Mean Control Reproduction: 36.2 young/female

C. Lab Culture Control Yes No

Mean Control Survival: % Mean Control Reproduction: young/female

D. Thiosulfate Control Yes No

Mean Control Survival: % Mean Control Reproduction: young/female

Test Variability

Test PMSD (growth) N/A Upper and Lower PMSD bound N/A low in-bounds high
Test PMSD (reprod.) 15.4% Upper and Lower PMSD bound 13-47% low in-bounds high

Permit Limits & Test Results

LC50	<u>Limits</u>	LC50	<u>Results</u>
	>100%		>100%
	Upper Value		± ∞
	Lower Value		100%
	Data Analysis		
	Method Used		Graphical
A-NOEC	N/A	A-NOEC	100%
C-NOEC	27.17%	C-NOEC	100%
	LOEC		>100%
IC25		IC25	>100%
IC50	N/A	IC50	>100%

PMSD Comparison Discussion (Test Variability/Sensitivity)

Reproduction

- 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).
- 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.
- 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.
- X 2. The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.
- 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary
- 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.
- 3b. The RPDs for the following concentrations are above the lower bound _____ . The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000:

Survival Reprod.

- X X 1. Ideal concentration-response relationship
 — — 2. All or nothing response
 — — 3. Stimulatory response at low concentrations and detrimental effects at higher concentrations
 — — 4. Stimulation at low concentrations but no significant effect at higher concentrations
 — — 5. Interrupted concentration-response: significant effects bracketed by non-significant effects
 — — 6. Interrupted concentration-response: non-significant effects bracketed by significant effects
 — — 7. Significant effects only at highest concentration
 — — 8. Significant effects at all test concentrations but flat concentration-response curve
 — — 9. Significant effects at all test concentrations with a sloped concentration-response curve
 — — 10. Inverse concentration-response relationship

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival Reprod.

- X X 1. Results are reliable and reportable.
 — — 2. Results are anomalous. An explanation is provided in the body of the report.
 — — 3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report.

NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET
 Facility Name: Specialty Minerals, Inc Test Start Date: 5/16/16
 NPDES Permit Number: MA0005991 Pipe Number: _____

<u>Test Type</u>	<u>Test Species</u>	<u>Sample Type</u>	<u>Sample Method</u>
<input type="checkbox"/> Acute	X Fathead Minnow	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input type="checkbox"/> Ceriodaphnia	<input type="checkbox"/> Dechlorinated	X Composite
X Modified (chronic reporting acute values)	<input type="checkbox"/> Daphnia Pulex	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flowthru
<input type="checkbox"/> 24hr screening	<input type="checkbox"/> Mysid Shrimp	<input type="checkbox"/> Chlorinated on site	<input type="checkbox"/> Other
	<input type="checkbox"/> Sheepshead	<input checked="" type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> Menidia		
	<input type="checkbox"/> Sea Urchin	TRC conc. <u>0.008</u> mg/L	
	<input type="checkbox"/> Champia		
	<input type="checkbox"/> Selenastrum		
	<input type="checkbox"/> Other _____		

Dilution Water

- receiving water collected at a point upstream of or away from the discharge, free from toxicity or other sources of contamination; (Receiving water name: Hoosic River)
- alternate surface water of known quality and a hardness, etc. to generally reflect the characteristics of the receiving water; (Surface water name: _____)
- X synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;
- or artificial sea salts mixed with deionized water;
- deionized water and hypersaline brine; or
- other _____

Effluent sampling date (s): 5/15-16/16 5/17-18/16 5/19-20/16

Effluent concentrations tested (in%): 0 6.25 12.5 25 27.17 50 100

* Permit limit concentration: 27.17%

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 5/2/16 Reference Toxicant Test Acceptable: Yes No

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS &PERMIT LIMITS

Test Acceptability Criteria

A. Synthetic Water Control

Mean Control Survival: 100% Mean Control Weight: 0.626 mg

B. Receiving Water Control

Mean Control Survival: 85% Mean Control Weight: 0.612 mg

C. Lab Culture Control Yes No

Mean Control Survival: % Mean Control Weight: mg

D. Thiosulfate Control Yes No

Mean Control Survival: % Mean Control Weight: mg

Test Variability

Test PMSD (growth) 27.2% Upper and Lower PMSD bound 12-30%

low in-bounds high

Test PMSD (reprod.) N/A Upper and Lower PMSD bound N/A

low in-bounds high

Permit Limits & Test Results

LC50	<u>Limits</u>	LC50	<u>Results</u>
	<u>>100%</u>		<u>>100%</u>
	Upper Value		$\pm \infty$
	Lower Value		100%
	Data Analysis		
	Method Used		Graphical
A-NOEC	N/A	A-NOEC	100%
C-NOEC	27.17%	C-NOEC	100%
	LOEC		>100%
IC25	N/A	IC25	>100%
IC50	N/A	IC50	>100%

PMSD Comparison Discussion (Test Variability/Sensitivity)

Growth

- _ 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).
- _ 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.
- _ 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.
- X 2. The PMSD falls within the upper (30%) and lower (12%) bounds. Results are reportable.
- _ 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary
- _ 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.
- _ 3b. The RPDs for the following concentrations are above the lower bound _____ . The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000:

Survival Growth

- | | |
|--|---|
| <input checked="" type="checkbox"/> <input type="checkbox"/> | 1. Ideal concentration-response relationship
2. All or nothing response
3. Stimulatory response at low concentrations and detrimental effects at higher concentrations
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6. Interrupted concentration-response: non-significant effects bracketed by significant effects
7. Significant effects only at highest concentration
8. Significant effects at all test concentrations but flat concentration-response curve
9. Significant effects at all test concentrations with a sloped concentration-response curve
10. Inverse concentration-response relationship |
|--|---|

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival Growth

- | | |
|--|---|
| <input checked="" type="checkbox"/> <input type="checkbox"/> | 1. Results are reliable and reportable.
2. Results are anomalous. An explanation is provided in the body of the report.
3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report. |
|--|---|

Whole Effluent Toxicity Testing Report Conclusions and Notes

Client Name/Project: Specialty Minerals, Inc Test Date: 5/16/16

Sample ID: Effluent

Your results were as follows:

- Passed all whole effluent toxicity permit limits
- Failed the following permit limit(s): *C. dubia*: LC50 C-NOEC *P. promelas*: LC50 C-NOEC
Please proceed according to the instructions in your permit.
- Original Test Invalid – **Valid retest performed. Both test and retest results are attached.**
- A retest using fresh samples must be performed within 30 days of the initial test completion date (____) due to the test condition described below. See next page for further explanation.
 Test Invalid due to: Diluent toxicity Synthetic control toxicity
 Test not sufficiently sensitive. PMSD exceeds upper bound.
 Results are inconclusive due to an unusual concentration-response relationship.
- Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the GZA Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.
- Additional testing for metals was required on the second and third effluent samples due to the following:
 Renewal sample(s) were of sufficient potency to cause lethality to 50% or more of the test organisms:
Sample #: 2 3 Species: Cd Pp Conc.: 6.25% 12.5% 25% 50% 100% ____%
 The test failed its permit limit for: *C. dubia*: LC50 C-NOEC *P. promelas*: LC50 C-NOEC

Diluent Toxicity:

- Testing will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
- Retesting will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
- This is your _____ case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.

Sampling Requirements:

A minimum of 3 samples were collected. Yes. No. See explanation on next page.

Samples were first used within 36 hours of collection. Yes. No. See explanation on next page.

Dechlorination Procedures: Chlorine was measured using 4500 CL-G DPD Colorimetric Method.
 Dechlorination was not required.

- Sample was dechlorinated to _____ mg/L by adding sodium thiosulfate to the sample prior to test initiation. A dechlorinated control of diluent water spiked with sodium thiosulfate equal in proportion to the amount added to the effluent sample was included in the test series.
- Chlorine elevated due to interference. Chlorine was _____ mg/L after interference check.
- Total Residual Chlorine was re-measured following aeration, and was found to be _____ mg/L.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____

[Date]

[Authorized Signature]

[Print or Type Name and Title]

[Print or Type the Permittee's Name]

[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the New England Bioassay Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. S 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____

[Date]

[Authorized Signature]

Kim Wills, Laboratory Manager

[Print or Type Name and Title]

New England Bioassay

[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts

If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Specialty Minerals, Inc.
ADDRESS: 260 Columbia Street
Adams, MA 01220
SAMPLE TYPE: Industrial Effluent
DILUTION WATER: Hoosic River

C.dubia TEST ID # 16-666a
COC # c36-2038/39
PROJECT # 05.0044739.00

INVERTEBRATES

TEST SET UP (TECH INIT) PD
TEST SPECIES *Ceriodaphnia dubia*
NEB LOT# Cd16 (RMH 105)
AGE < 24 hours
TEST SOLUTION VOLUME (mls) 15
NO. ORGANISMS PER TEST CHAMBER 1
NO. ORGANISMS PER CONCENTRATION 10

Laboratory Control Water (CTRMH)

Batch Number	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃
CTR16(MH004)	96	60

	DATE	TIME
TEST START:	5/16/16	1345
TEST END:	5/22/16	1233

Results of *Ceriodaphnia dubia* Chronic Test

95% Confidence
Limits

48 Hour LC50	>100%	100%±∞
7 Day LC50	>100%	100%±∞
Survival NOEC	100%	
Survival LOEC	>100%	
Reproduction NOEC	100%	
Reproduction LOEC	>100%	
Reproduction IC ₂₅	>100%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATION LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments: _____

REVIEWD BY: R. M. H.

DATE: 6/8/16

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:		Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220									
NEB PROJECT NUMBER:		05.0044739.00			NEB TEST NUMBER: 16-666a					COC #	c36-2038/39
TEST ORGANISM:		Ceriodaphnia dubia			AGE: <24 hours					Lot # Cd16 (RMH 105)	
START DATE:		5/16/16		TIME: 1345		END DATE: 5/22/16		TIME: 1233			

Effluent Concentration	Day Number	Culture Lot# Cd16 (RMH 105)										Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts			
		Replicate																
		Cup #	A8	A12	A13	B1	B3	B4	B5	B6	B7	B12						
NEB Lab Synthetic Control	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	PD			
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	KO			
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	KO			
	3	6	5	4	6	6	6	6	6	6	6	6	57	10	PD	PD		
	4	12	11	10	12	10	12	10	13	11	11	11	112	10	PD	PD		
	5	18	16	17	16	15	17	18	15	21	20	20	173	10	PD	PD		
	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	MV	MV		
	7																	
	totals	36	32	31	34	31	35	34	34	38	37	37	342	10	MG			
Hoosic River Diluent		A	B	C	D	E	F	G	H	I	J							
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10				
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10				
	3	6	6	6	6	7	7	6	6	5	7	62	10					
	4	12	12	12	13	10	14	10	12	12	14	121	10					
	5	19	18	18	19	22	✓	18	✓	19	✓	133	10					
	6	✓	✓	✓	✓	✓	22	✓	✓	✓	24	46	10					
	7																	
	totals	37	36	36	38	39	43	34	18	36	45	362	10					
6.25%		A	B	C	D	E	F	G	H	I	J							
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10				
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10				
	3	6	5	6	5	5	7	8	6	5	7	60	10					
	4	9	12	11	11	11	11	11	10	12	6	104	10					
	5	16	18	16	9	✓	✓	✓	✓	18	✓	77	10					
	6	✓	✓	✓	✓	✓	18	24	23	22	✓	23	110	10				
	7																	
	totals	31	35	33	25	34	42	42	38	35	36	351	10					

Notes:

Neonates on day 6 marked with a strike-through are considered to be 4th broods and are not included in the statistical analysis for reproduction per EPA-821-R-02-013

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220		
NEB PROJECT NUMBER:	05.0044739.00	ORGANISM: <i>Ceriodaphnia dubia</i>	START DATE: 5/16/16

Effluent Concentration	Day Number	Replicate										Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
		A	B	C	D	E	F	G	H	I	J				
12.5%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	10	10	10
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		0		
	3	6	6	7	6	6	6	6	6	5	6		60		
	4	10	11	10	12	10	13	10	8	12	12		108		
	5	1	20	16	17	19	✓	19	✓	18	20		130		
	6	✓	✓	✓	✓	✓	19	✓	19	✓	✓		38		
	7														
	totals	17	37	33	35	35	38	35	33	35	38		336		
		A	B	C	D	E	F	G	H	I	J				
25%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	10	10	10
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		0		
	3	6	✓	6	6	6	6	6	✓	7	6		49		
	4	11	5	11	12	12	12	10	13	11	11		108		
	5	21	15	22	17	20	17	16	✓	16	19		163		
	6	✓	✓	26	✓	✓	✓	✓	20	✓	✓		20		
	7														
	totals	38	20	39	35	38	35	32	33	34	36		340		
		A	B	C	D	E	F	G	H	I	J				
27.17%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	10	10	10
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		0		
	3	6	5	6	6	4	7	7	6	6	6		59		
	4	11	10	10	11	11	12	12	11	13	10		111		
	5	19	17	18	18	20	✓	✓	✓	✓	✓		92		
	6	✓	✓	✓	✓	✓	24	23	22	24	22		115		
	7														
	totals	36	32	34	35	35	43	42	39	43	38		377		
		A	B	C	D	E	F	G	H	I	J				
50%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	10	10	10
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		0		
	3	5	5	6	2	6	6	7	5	6	6		54		
	4	8	10	10	12	12	13	13	12	12	11		113		
	5	15	19	16	15	22	15	17	15	18	20		172		
	6	23	24	25	22	25	✓	✓	✓	24	✓		0		
	7														
	totals	28	34	32	29	40	34	37	32	36	37		339		
		A	B	C	D	E	F	G	H	I	J				

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS: Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220
NEB PROJECT NUMBER: 05.0044739.00 ORGANISM: *Ceriodaphnia dubia* START DATE: 5/16/16

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 1 of 5)
Test Code: 16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:	09-8659-7574	Endpoint:	2d Survival Rate	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:14	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	09-8959-3783	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:45	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Receiving Water
Ending Date:	22 May-16 12:33	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	5d 23h	Source:	In-House Culture	Age:	<24
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1524700	200	Yes	Two-Point Interpolation

Point Estimates

Level	95% LCL	95% UCL
LC50 >100	N/A	N/A

2d Survival Rate Summary

Group	Control Type	Count	Calculated Variate(A/B)								
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
6.25		10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
27.1		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	1	1	1	0	0	0.0%	0.0%	10	10

2d Survival Rate Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
27.1		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

2d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
27.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 2 of 5)
Test Code: 16-666a | 19-8998-4436

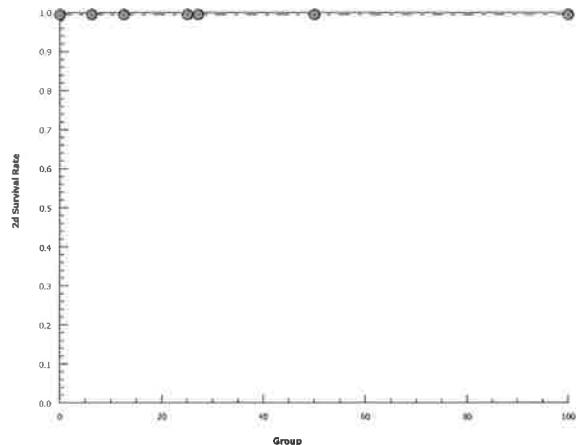
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 09-8659-7574 Endpoint: 2d Survival Rate
Analyzed: 02 Jun-16 10:14 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 3 of 5)
 Test Code: 16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 19-3982-4645	Endpoint: 6d Survival Rate	CETIS Version: CETISv1.8.8
Analyzed: 02 Jun-16 10:14	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 09-8959-3783	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 16 May-16 13:45	Protocol: EPA/821/R-02-013 (2002)	Diluent: Receiving Water
Ending Date: 22 May-16 12:33	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 5d 23h	Source: In-House Culture	Age: <24
Sample ID: 05-2760-8714	Code: 1F72AB8A	Client: Specialty Minerals, Inc.
Sample Date: 16 May-16 06:43	Material: Not Applicable	Project:
Receive Date: 16 May-16 10:44	Source: Specialty Minerals	
Sample Age: 7h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1608399	200	Yes	Two-Point Interpolation

Point Estimates

Level	95% LCL	95% UCL
LC50	>100	N/A

6d Survival Rate Summary**Calculated Variate(A/B)**

Group	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	10	1	1	1	0	0	0.0%	0.0%	10	10
6.25		10	1	1	1	0	0	0.0%	0.0%	10	10
12.5		10	1	1	1	0	0	0.0%	0.0%	10	10
25		10	1	1	1	0	0	0.0%	0.0%	10	10
27.1		10	1	1	1	0	0	0.0%	0.0%	10	10
50		10	1	1	1	0	0	0.0%	0.0%	10	10
100		10	1	1	1	0	0	0.0%	0.0%	10	10

6d Survival Rate Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
27.1		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

6d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
27.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 4 of 5)
Test Code: 16-666a | 19-8998-4436

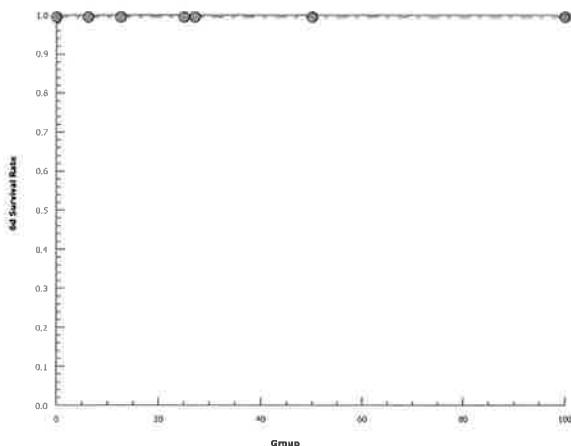
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 19-3982-4645 Endpoint: 6d Survival Rate
Analyzed: 02 Jun-16 10:14 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 5 of 5)
 Test Code: 16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:	10-1114-6315	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:15	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	09-8959-3783	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:45	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Receiving Water
Ending Date:	22 May-16 12:33	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	5d 23h	Source:	In-House Culture	Age:	<24
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	416389	200	Yes	Two-Point Interpolation

Point Estimates

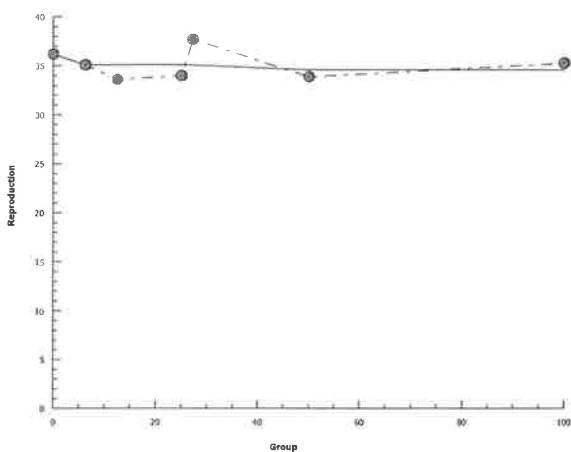
Level	95% LCL	95% UCL
IC25	>100	N/A
IC50	>100	N/A

Reproduction Summary

Group	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	36.2	18	45	2.289	7.239	20.0%	0.0%
6.25		10	35.1	25	42	1.595	5.043	14.37%	3.04%
12.5		10	33.6	17	38	1.928	6.096	18.14%	7.18%
25		10	34	20	39	1.713	5.416	15.93%	6.08%
27.1		10	37.7	32	43	1.248	3.945	10.47%	-4.14%
50		10	33.9	28	40	1.187	3.755	11.08%	6.35%
100		10	35.3	25	43	1.564	4.945	14.01%	2.49%

Reproduction Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	37	36	36	38	39	43	34	18	36	45
6.25		31	35	33	25	34	42	42	38	35	36
12.5		17	37	33	35	35	38	35	33	35	38
25		38	20	39	35	38	35	32	33	34	36
27.1		36	32	34	35	35	43	42	39	43	38
50		28	34	32	29	40	34	37	32	36	37
100		36	36	31	36	38	43	25	35	33	40

Graphics

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 1 of 2)
 Test Code: 16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:	08-9272-0155	Endpoint:	6d Survival Rate	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:15	Analysis:	STP 2x2 Contingency Tables	Official Results:	Yes
Batch ID:	09-8959-3783	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:45	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Receiving Water
Ending Date:	22 May-16 12:33	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	5d 23h	Source:	In-House Culture	Age:	<24
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Data Transform	Zeta	Alt	Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T		NA	NA	100	>100	NA	

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Value	P-Type	Decision(α :5%)
Dilution Water		6.25	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		25	1	1.0000	Exact	Non-Significant Effect
		27.1	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	1	1.0000	Exact	Non-Significant Effect

Data Summary

Group	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Dilution Water	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
27.1		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

6d Survival Rate Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
6.25		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
25		1	1	1	1	1	1	1	1	1	1
27.1		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	1	1	1	1	1	1	1	1

6d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
27.1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 2 of 2)
Test Code: 16-666a | 19-8998-4436

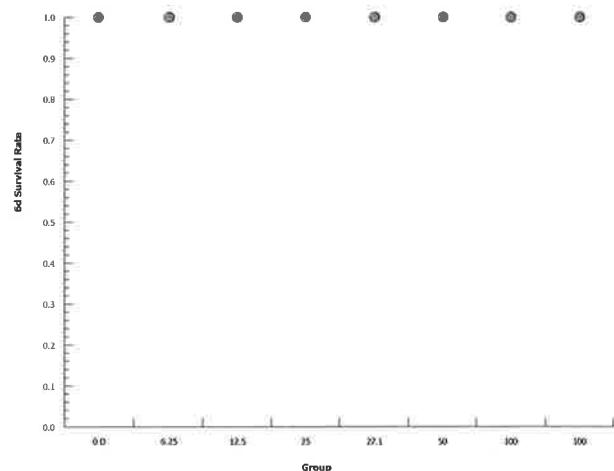
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 08-9272-0155 Endpoint: 6d Survival Rate
Analyzed: 02 Jun-16 10:15 Analysis: STP 2x2 Contingency Tables

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date:

02 Jun-16 10:15 (p 1 of 2)

Test Code:

16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID:	07-5580-1934	Endpoint:	Reproduction	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:15	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes
Batch ID:	09-8959-3783	Test Type:	Reproduction-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:45	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Receiving Water
Ending Date:	22 May-16 12:33	Species:	Ceriodaphnia dubia	Brine:	Not Applicable
Duration:	5d 23h	Source:	In-House Culture	Age:	<24
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	15.4%	100	>100	NA	

Steel Many-One Rank Sum Test

Control	vs	Group	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water		6.25	89.5	74	3	18	0.3684	Asymp	Non-Significant Effect
		12.5	83.5	74	2	18	0.1921	Asymp	Non-Significant Effect
		25	87.5	74	4	18	0.3034	Asymp	Non-Significant Effect
		27.1	104	74	5	18	0.8355	Asymp	Non-Significant Effect
		50	84.5	74	3	18	0.2172	Asymp	Non-Significant Effect
		100	93.5	74	3	18	0.5092	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	129.0857	21.51429	6	0.7589	0.6048	Non-Significant Effect
Error	1786	28.34921	63			
Total	1915.086		69			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Bartlett Equality of Variance	5.485	16.81	0.4833	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8886	0.9526	<0.0001	Non-normal Distribution

Reproduction Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	10	36.2	31.02	41.38	36.5	18	45	2.289	20.0%	0.0%
6.25		10	35.1	31.49	38.71	35	25	42	1.595	14.37%	3.04%
12.5		10	33.6	29.24	37.96	35	17	38	1.928	18.14%	7.18%
25		10	34	30.13	37.87	35	20	39	1.713	15.93%	6.08%
27.1		10	37.7	34.88	40.52	37	32	43	1.248	10.47%	-4.14%
50		10	33.9	31.21	36.59	34	28	40	1.187	11.08%	6.35%
100		10	35.3	31.76	38.84	36	25	43	1.564	14.01%	2.49%

Reproduction Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	37	36	36	38	39	43	34	18	36	45
6.25		31	35	33	25	34	42	42	38	35	36
12.5		17	37	33	35	35	38	35	33	35	38
25		38	20	39	35	38	35	32	33	34	36
27.1		36	32	34	35	35	43	42	39	43	38
50		28	34	32	29	40	34	37	32	36	37
100		36	36	31	36	38	43	25	35	33	40

CETIS Analytical Report

Report Date: 02 Jun-16 10:15 (p 2 of 2)
Test Code: 16-666a | 19-8998-4436

Ceriodaphnia 7-d Survival and Reproduction Test

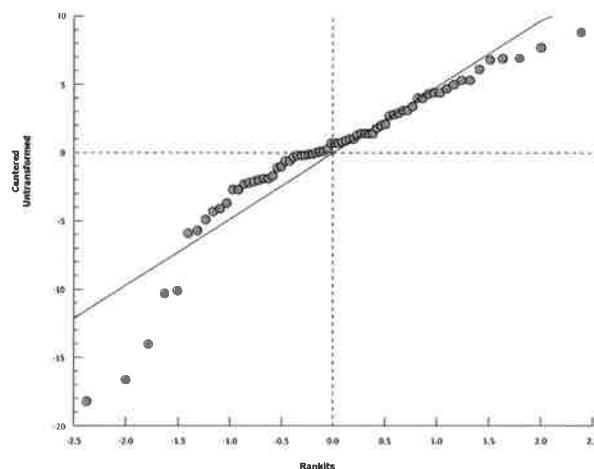
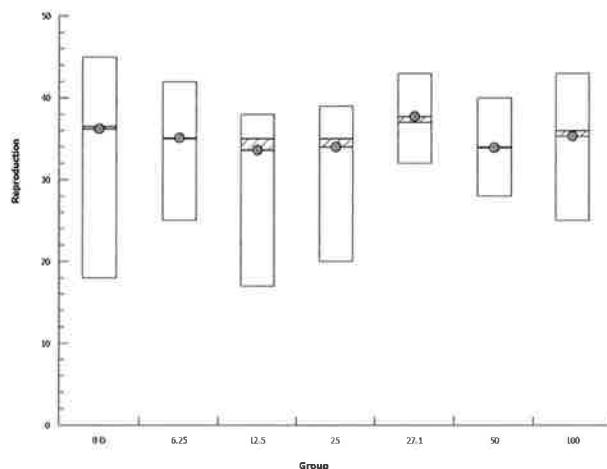
New England Bioassay

Analysis ID: 07-5580-1934
Analyzed: 02 Jun-16 10:15

Endpoint: Reproduction
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:		Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220					
NEB PROJECT NUMBER:		05.0044739.00		TEST ORGANISM		<i>Ceriodaphnia dubia</i>	
DILUTION WATER SOURCE:		Hoosic River			START DATE:	5/16/16	TIME: 1345
ANALYST	PD	KO	MV	ER	CW	PD	
NEB Lab Synthetic Control	1	2	3	4	5	6	7
Temp °C Initial	24.0	24.0	24.7	24.0	24.7	24.6	
D.O. mg/L Initial	8.3	8.4	8.6	8.3	8.4	8.4	
pH s.u. Initial	7.8	7.8	7.8	7.8	7.9	8.2	
Conductivity µS Initial	329	332	326	323	321	329	
Temp °C Final	26.0	25.1	24.0	24.0	24.0	25.0	
D.O. mg/L Final	8.4	8.3	8.5	8.6	8.5	9.0	
pH s.u. Final	8.1	8.0	7.9	8.3	8.3	8.3	
Conductivity µS Final	354	369	350	343	360	351	
Hoosic River Diluent	1	2	3	4	5	6	7
Temp °C Initial	24.0	24.0	25.0	24.1	24.4	25.2	
D.O. mg/L Initial	9.1	8.3	8.5	9.3	9.8	8.7	
pH s.u. Initial	7.7	7.8	7.8	7.9	7.9	8.2	
Conductivity µS Initial	260	258	273	271	280	283	
Temp °C Final	26.0	25.2	24.0	24.0	24.0	25.5	
D.O. mg/L Final	8.5	8.2	8.5	8.6	8.5	9.0	
pH s.u. Final	8.4	8.1	8.0	8.3	8.4	8.4	
Conductivity µS Final	278	289	297	292	316	306	
6.25%	1	2	3	4	5	6	7
Temp °C Initial	24.0	24.0	24.6	24.0	24.3	25.3	
D.O. mg/L Initial	9.1	8.6	9.5	9.2	9.7	8.8	
pH s.u. Initial	7.7	7.8	7.9	8.0	7.9	8.1	
Conductivity µS Initial	278	278	290	285	299	298	
Temp °C Final	26.0	25.2	24.0	24.0	24.0	25.5	
D.O. mg/L Final	8.7	8.4	8.5	8.7	8.7	9.0	
pH s.u. Final	8.4	8.2	8.1	8.4	8.5	8.6	
Conductivity µS Final	297	301	314	306	343	329	
12.5%	1	2	3	4	5	6	7
Temp °C Initial	24.0	24.0	24.7	24.0	24.3	25.5	
D.O. mg/L Initial	9.1	8.8	9.4	9.1	9.6	8.7	
pH s.u. Initial	7.7	7.8	7.9	8.0	7.9	8.1	
Conductivity µS Initial	295	298	307	308	319	319	
Temp °C Final	25.8	25.2	24.0	24.0	24.0	25.4	
D.O. mg/L Final	8.7	8.4	8.6	8.8	8.8	9.0	
pH s.u. Final	8.5	8.2	8.1	8.4	8.6	8.6	
Conductivity µS Final	311	321	330	327	348	335	

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:		Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220						
NEB PROJECT NUMBER:		05.0044739.00		TEST ORGANISM	<i>Ceriodaphnia dubia</i>			
DILUTION WATER SOURCE:		Hoosic River		START DATE:	5/16/16	TIME: 1345		
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.0	24.0	24.7	24.0	24.3	25.7		
D.O. mg/L Initial	9.0	8.7	9.6	9.1	9.5	8.7		
pH s.u. Initial	7.8	7.8	7.8	8.0	7.8	8.1		
Conductivity µS Initial	335	335	345	340	357	352		
Temp °C Final	25.9	25.4	24.0	24.0	24.0	25.5		
D.O. mg/L Final	8.7	8.5	8.6	8.7	8.7	9.0		
pH s.u. Final	8.5	8.3	8.2	8.4	8.6	8.6		
Conductivity µS Final	352	368	370	360	381	367		
27.17%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.0	24.0	24.6	24.0	24.3	25.8		
D.O. mg/L Initial	9.0	8.8	9.4	9.1	9.4	8.7		
pH s.u. Initial	7.8	7.9	7.9	8.0	7.8	8.1		
Conductivity µS Initial	340	343	354	349	361	367		
Temp °C Final	26.0	25.4	24.0	24.0	24.0	25.5		
D.O. mg/L Final	8.7	8.5	8.6	8.7	8.6	9.0		
pH s.u. Final	8.5	8.3	8.3	8.4	8.6	8.6		
Conductivity µS Final	379	364	387	376	437	409		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.0	24.0	24.7	24.0	24.4	25.9		
D.O. mg/L Initial	9.0	8.8	9.4	9.1	9.3	8.6		
pH s.u. Initial	7.7	7.9	7.9	7.9	7.8	8.0		
Conductivity µS Initial	410	409	418	417	433	437		
Temp °C Final	26.0	25.6	24.0	24.0	24.0	25.5		
D.O. mg/L Final	8.8	8.5	8.8	8.8	8.7	9.0		
pH s.u. Final	8.5	8.4	8.4	8.5	8.6	8.6		
Conductivity µS Final	459	437	469	440	466	459		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	24.0	24.0	24.6	24.0	24.5	26.0		
D.O. mg/L Initial	8.9	8.0	9.0	9.1	9.1	8.6		
pH s.u. Initial	7.7	7.9	7.8	7.9	7.7	7.9		
Conductivity µS Initial	561	558	561	561	581	587		
Temp °C Final	26.0	25.6	24.0	24.0	24.0	24.0		
D.O. mg/L Final	8.9	8.6	8.9	9.0	8.7	9.0		
pH s.u. Final	8.4	8.4	8.4	8.5	8.6	8.7		
Conductivity µS Final	507	559	567	558	554	554		

Table of Random Permutations of 16

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16

11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10

reps.

1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9	15	11	3	11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
10	16	4	5	12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3	10	16	16	13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
11	13	9	13	4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12	5	10	7	2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
8	9	8	10	6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2

conc.

7	2	3	3	12
12	12	1	4	7
1	14	8	8	16
5	11	2	9	3
16	3	11	11	8
4	4	6	6	9
11	10	4	5	1
8	15	9	1	14
2	16	10	12	4
9	5	12	16	6
10	6	14	10	11
13	8	5	15	5
15	7	15	7	13
3	1	13	13	10
6	9	16	2	2
14	13	7	14	15

Brood mother source: RMH 100 - A7

Source's brood size: 14 (Qty.)

Specialty Minerals, 5-16-16

Tech	LC	MG	U	U	LC		U	U																		
Date	5/9	5/10	5/11	5/12	5/13		5/15	5/16																		
Day acc.	0	1	2	3	4	5	6	7												8	9	10	11	12	13	14
Cup #																										
1	N	N	N	N	5		ZY	N	1																	
2	N	N	N	N	4		ZY	N	2																	
3	N	N	N	N	6		ZY	N	3																	
4	N	N	N	N	4		ZY	N	4																	
5	N	N	N	N	4		ZY	N	5																	
6	N	N	N	N	6		11	Y	6																	
7	N	N	N	N	5		ZY	N	7																	
8	N	N	N	N	6		11	IS T1	8																	
9	N	N	N	N	6		ZY	N	9																	
10	N	N	N	N	4		ZY	N	10																	
11	N	N	N	N	4		9	15	11																	
12	N	N	N	N	5		9	13 T2	12																	
13	N	N	N	N	5		11	13 T3	13																	

Y = neonates present, and criterion has been met: ≥ 20 neonates produced in total by 3rd brood.

N = no neonates

2B = two broods present. 2Y = two broods and criterion met: ≥ 20 neos. by 3rd brood.

X = brood mother dead ae = aborted eggs

✓ or P = neonates present after renewal on previous day (see time in log).

A → = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted).

acc. = if acclimated, H₂O type used w/ renewal this day.

Test organism collection:

Tray diagram
used?

Project #

Symbols (✓ / P) (Y/N)

Time period, neonates released

Collection date / time

0044739	T	-	Y	5-15-16 / 1420 → 1900	5-16-16 / 1050
	T				
	T				
	T				
	T				
	T				

Brood mother source: RMT 100 - B11, 12 Source's brood size: 13,10 (Qty.) Specialty Minerals, 5-16-16

Tech	LC	MB	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	LC	
Date	5/9	5/10	5/11	5/12	5/13		5/15	5/16														
Day acc.	0	1	2	3	4	5	6	7								8	9	10	11	12	13	14
Cup #																						
1	N	N	N	A	N	4		12	12	T4						1						
2	N	N	N	N	N	6		2y	N							2						
3	N	N	N	N	N	5		11	13	T5						3						
4	N	N	N	N	N	4		8	13	T6						4						
5	N	N	N	N	N	5		9	14	T7						5						
6	N	N	N	N	N	5		9	13	T8						6						
7	N	N	N	N	N	4		9	13	T9						7						
8	N	N	N	N	N	4		11	y							8						
9	N	N	N	N	N	4		12	y							9						
10	N	N	N	N	N	6		13	y							10						
11	N	N	N	N	N	5		8	15							11						
12	N	N	N	N	N	5		10	14	T10						12						
13	N	N	N	N	N	6		10	y							13						

Y = neonates present, and criterion has been met: ≥ 20 neonates produced in total by 3rd brood.

N = no neonates

2B = two broods present. 2Y = two broods and criterion met: ≥ 20 neos. by 3rd brood.

X = brood mother dead ae = aborted eggs

✓ or P = neonates present after renewal on previous day (see time in log).

A → = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted).

acc. = if acclimated, H₂O type used w/ renewal this day.

Test organism collection:

Tray diagram
used?

Project #	Symbols (✓ / P) (Y/N)			Time period, neonates released	Collection date / time
0044739	T	-	Y	5-15-16 / 1420 → 1900	5-16-16 / 1050
	T				
	T				
	T				
	T				
	T				

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Specialty Minerals, Inc.
ADDRESS: 260 Columbia Street
Adams, MA 01220
SAMPLE TYPE: Industrial Effluent
DILUTION WATER: Moderately Hard Synthetic

P.promelas TEST ID # 16-666b
COC # c36-2038/39
PROJECT # 05.0044739.00

VERTEBRATES

TEST SET UP (TECH INIT) ER
TEST SPECIES *Pimephales promelas*
NEB LOT# Pp16 (5-16)
AGE < 24 hours
TEST SOLUTION VOLUME (mls) 400
NO. ORGANISMS PER TEST CHAMBER 10
NO. ORGANISMS PER CONCENTRATION 40

Laboratory Control Water (MHRCF)

Batch Number	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃
C36-MH005	88	60

	DATE	TIME
TEST START:	5/16/16	1332
TEST END:	5/23/16	1222

Results of *Pimephales promelas* Chronic Test

95% Confidence
Limits

48 Hour LC50	>100%	100%±∞
7 Day LC50	>100%	100%±∞
Survival NOEC	100%	
Survival LOEC	>100%	
Growth NOEC	100%	
Growth LOEC	>100%	
Growth IC ₂₅	>100%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATION LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments: _____

REVIEWD BY: R. Mills DATE: 6/8/16

**NEB'S SURVIVAL DATA SHEET FOR FATHEAD MINNOW LARVAL
SURVIVAL AND GROWTH TEST**

FACILITY NAME & ADDRESS:	Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220							
NEB PROJECT NUMBER:	05.0044739.00	TEST NUMBER:	16-666b	COC #	c36-2038/39			
TEST ORGANISM:	<i>Pimephales promelas</i>	AGE:	<24 hours	Lot #	Pp16 (5-16)			
START DATE:	5/16/16	TIME:	1332	END DATE:	5/23/16	TIME:	1222	

Effluent Concentration	Replicate Number	Number of Survivors								
		Day								
		0	1	2	3	4	5	6	7	Remarks
	ANALYST	ER	ER	MV	CW	CW	PD	PD	ER	
NEB Lab Synthetic Diluent	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
Hoosic River Control	A	10	10	10	9	8	8	8	8	
	B	10	10	10	10	7	7	7	7	
	C	10	10	10	9	9	9	9	9	
	D	10	10	10	10	10	10	10	10	
6.25%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	9	1	1	1	1	
12.5%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
25%	A	10	10	10	10	10	9	9	9	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	9	9	9	
27.17%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	9	9	9	9	8	8	10	
50%	A	10	10	10	10	9	9	9	9	
	B	10	10	10	10	10	9	9	9	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	

D.O. concentration fell below 4.0 mg/L _____

All test solutions were aerated at <100 bubbles/minute as of _____

**NEB'S SURVIVAL DATA SHEET FOR FATHEAD MINNOW LARVAL
SURVIVAL AND GROWTH TEST**

FACILITY NAME & ADDRESS: <u>Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220</u>									
NEB PROJECT NUMBER:	<u>05.0044739.00</u>		TEST NUMBER:	<u>16-666b</u>		COC #	<u>c36-2038/39</u>		
TEST ORGANISM:	<u>Pimephales promelas</u>			AGE:	<u><24 hours</u>		Lot #	<u>Pp16 (5-16)</u>	
START DATE:	<u>5/16/16</u>	TIME:	<u>1332</u>	END DATE:	<u>5/23/16</u>	TIME:	<u>1222</u>		

Effluent Concentration	Replicate Number	Number of Survivors								
		Day								Remarks
		0	1	2	3	4	5	6	7	
	ANALYST	ER	ER	MV	CW	CW	PD	PD	ER	
100%	A	10	10	10	10	10	9	9	9	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	

NEW ENGLAND BIOASSAY OBSERVATION DATA FORM

Client: Specialty Minerals, Inc.

Test Species: Pimephales promelas

Test ID: 16-666b

Sample: Effluent

Test Date: 5/16/16

Project # 05.0044739.00

Concentration or Dilution	Number of Live Organisms	All organisms appear healthy and normal unless noted			
		Day	3	Observations	Date: 5/19/16 Technician: CW
Synth Dil	40				
River Control	38			1 dead in Reps A and C, both with fungus	
6.25%	39			1 dead in Rep D, no fungus	
12.5%	40				
25%	40				
27.17%	39				
50%	40				
100%	40				
		Day	4	Observations	Date: 5/20/16 Technician: CW
Synth Dil	40				
River Control	34			1 dead in Rep A, 3 dead in Rep B, all with fungus	
6.25%	31			8 dead in Rep D with fungus	
12.5%	40				
25%	40				
27.17%	39				
50%	39			1 dead in Rep A with fungus	
100%	40				

NEW ENGLAND BIOASSAY OBSERVATION DATA FORM

Client: Specialty Minerals, Inc.

Test Species: Pimephales promelas

Test ID: 16-666b

Sample: Effluent

Test Date: 5/16/16

Project # 05.0044739.00

Concentration or Dilution	Number of Live Organisms	All organisms appear healthy and normal unless noted				
		Day	5	Observations	Date:	5/21/16 Technician: PD
Synth Dil	40					
River Control	34					
6.25%	31					
12.5%	40					
25%	38	1 dead in reps A and D with fungus				
27.17%	38	1 dead in rep D with fungus				
50%	38	1 dead in rep C with fungus				
100%	39	1 dead in rep A with fungus				
		Day	6	Observations	Date:	5/22/16 Technician: PD
Synth Dil	40					
River Control	34					
6.25%	31					
12.5%	40					
25%	38					
27.17%	38					
50%	38					
100%	39					

NEW ENGLAND BIOASSAY WEIGHT DATA FOR FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

FACILITY NAME & ADDRESS:	Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220		
NEB PROJECT #	05.0044739.00	NEB TEST NUMBER:	16-666b
TEST START DATE	5/16/16	WEIGHING DATE:	5/26/16
TEST END DATE	5/23/16		
DRYING TEMPERATURE (°C)	100 ± 4	DRYING TIME:	minimum 6 hours
ANALYST-INITIAL WEIGHTS	PD	ANALYST-FINAL WEIGHTS	ER
Effluent Concentration	Replicate Number	A Weight of boat (mg)	B Dry Weight: Foil and Larvae (mg)
NEB Lab Synthetic Diluent	A	929.01	935.07
	B	928.62	935.08
	C	927.13	933.55
	D	926.52	932.62
Hoosic River Control	A	929.43	935.40
	B	937.94	943.10
	C	928.86	935.25
	D	936.44	943.41
6.25%	A	934.95	941.59
	B	939.17	945.86
	C	935.12	942.24
	D	934.54	936.37
12.5%	A	939.80	946.40
	B	936.24	942.86
	C	935.21	941.86
	D	936.73	943.76
25%	A	935.97	942.45
	B	937.89	945.11
	C	940.13	947.60
	D	940.64	947.75
27.17%	A	936.92	944.12
	B	939.60	946.89
	C	935.74	942.88
	D	939.84	946.33
50%	A	938.64	945.10
	B	937.39	944.04
	C	935.13	941.95
	D	939.61	946.13
100%	A	938.18	944.63
	B	934.25	941.08
	C	936.05	943.07
	D	938.60	945.62

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 1 of 5)
 Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test**New England Bioassay**

Analysis ID:	18-9925-3234	Endpoint:	2d Survival Rate	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:31	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	18-8904-6168	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:32	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 May-16 12:22	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	In-House Culture	Age:	<24h
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1834695	200	Yes	Two-Point Interpolation

Point Estimates

Level	95% LCL	95% UCL
LC50	>100	N/A

2d Survival Rate Summary

Group	Control Type	Count	Calculated Variate(A/B)								
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	4	1	1	1	0	0	0.0%	0.0%	40	40
6.25		4	1	1	1	0	0	0.0%	0.0%	40	40
12.5		4	1	1	1	0	0	0.0%	0.0%	40	40
25		4	1	1	1	0	0	0.0%	0.0%	40	40
27.1		4	0.975	0.9	1	0.025	0.05	5.13%	2.5%	39	40
50		4	1	1	1	0	0	0.0%	0.0%	40	40
100		4	1	1	1	0	0	0.0%	0.0%	40	40

2d Survival Rate Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
6.25		1	1	1	1
12.5		1	1	1	1
25		1	1	1	1
27.1		1	1	1	0.9
50		1	1	1	1
100		1	1	1	1

2d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
27.1		10/10	10/10	10/10	9/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 2 of 5)
Test Code: 16-666b | 19-7961-8961

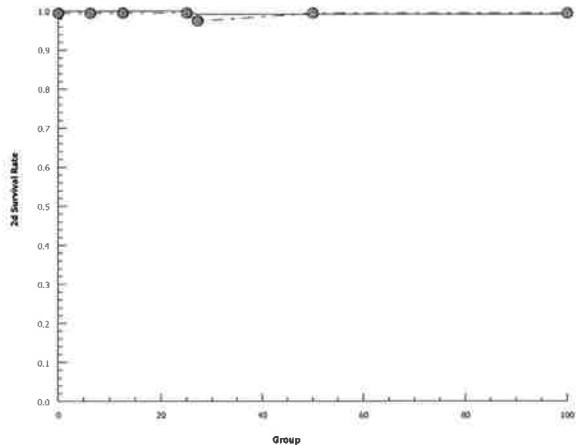
Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 18-9925-3234 Endpoint: 2d Survival Rate
Analyzed: 02 Jun-16 10:31 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date:

02 Jun-16 10:32 (p 3 of 5)

Test Code:

16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test**New England Bioassay**

Analysis ID:	11-9511-1717	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:31	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	18-8904-6168	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:32	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 May-16 12:22	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	In-House Culture	Age:	<24h
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	922269	200	Yes	Two-Point Interpolation

Point Estimates

Level	95% LCL	95% UCL
LC50	>100	N/A

7d Survival Rate Summary

Calculated Variate(A/B)											
Group	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Dilution Water	4	1	1	1	0	0	0.0%	0.0%	40	40
6.25		4	0.775	0.1	1	0.225	0.45	58.06%	22.5%	31	40
12.5		4	1	1	1	0	0	0.0%	0.0%	40	40
25		4	0.95	0.9	1	0.02887	0.05773	6.08%	5.0%	38	40
27.1		4	1	1	1	0	0	0.0%	0.0%	40	40
50		4	0.95	0.9	1	0.02887	0.05773	6.08%	5.0%	38	40
100		4	0.975	0.9	1	0.025	0.05	5.13%	2.5%	39	40

7d Survival Rate Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
6.25		1	1	1	0.1
12.5		1	1	1	1
25		0.9	1	1	0.9
27.1		1	1	1	1
50		0.9	0.9	1	1
100		0.9	1	1	1

7d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
27.1		10/10	10/10	10/10	9/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 4 of 5)
Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test

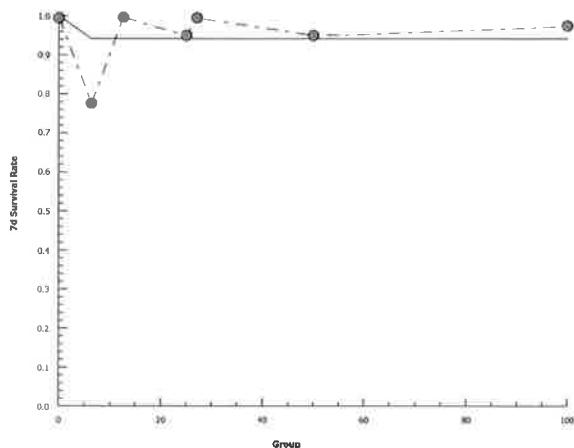
New England Bioassay

Analysis ID: 11-9511-1717
Analyzed: 02 Jun-16 10:31

Endpoint: 7d Survival Rate
Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date:

02 Jun-16 10:32 (p 5 of 5)

Test Code:

16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test**New England Bioassay**

Analysis ID:	20-4653-2515	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:32	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes
Batch ID:	18-8904-6168	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:32	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 May-16 12:22	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	In-House Culture	Age:	<24h
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1294936	200	Yes	Two-Point Interpolation

Point Estimates

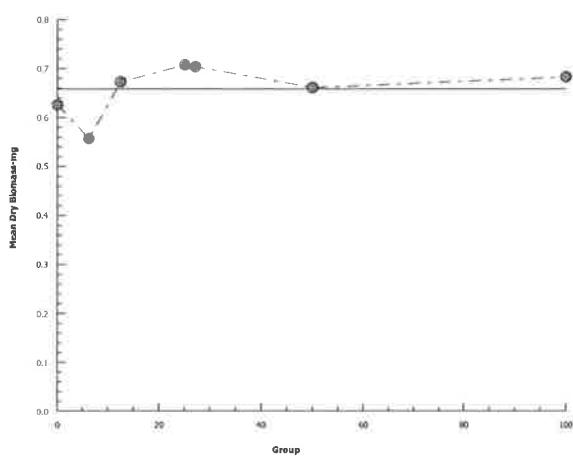
Level	95% LCL	95% UCL
IC25	>100	N/A
IC50	>100	N/A

Mean Dry Biomass-mg Summary

Group	Control Type	Count	Calculated Variate						
			Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.626	0.606	0.646	0.01046	0.02091	3.34%	0.0%
6.25		4	0.557	0.183	0.712	0.1251	0.2503	44.93%	11.02%
12.5		4	0.6725	0.66	0.703	0.01022	0.02044	3.04%	-7.43%
25		4	0.707	0.648	0.747	0.02106	0.04212	5.96%	-12.94%
27.1		4	0.703	0.649	0.729	0.01826	0.03653	5.2%	-12.3%
50		4	0.6612	0.646	0.682	0.007973	0.01595	2.41%	-5.63%
100		4	0.683	0.645	0.702	0.01344	0.02687	3.93%	-9.11%

Mean Dry Biomass-mg Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	0.606	0.646	0.642	0.61
6.25		0.664	0.669	0.712	0.183
12.5		0.66	0.662	0.665	0.703
25		0.648	0.722	0.747	0.711
27.1		0.72	0.729	0.714	0.649
50		0.646	0.665	0.682	0.652
100		0.645	0.683	0.702	0.702

Graphics

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 1 of 4)
 Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID:	21-3256-0096	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:31	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes
Batch ID:	18-8904-6168	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:32	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 May-16 12:22	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	In-House Culture	Age:	<24h
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	25.5%	100	>100	NA	

Steel Many-One Rank Sum Test

Control	vs	Group	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water		6.25	16	10	1	6	0.6451	Asymp	Non-Significant Effect
		12.5	18	10	1	6	0.8571	Asymp	Non-Significant Effect
		25	14	10	1	6	0.3760	Asymp	Non-Significant Effect
		27.1	18	10	1	6	0.8571	Asymp	Non-Significant Effect
		50	14	10	1	6	0.3760	Asymp	Non-Significant Effect
		100	16	10	1	6	0.6451	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	0.2273043	0.03788404	6	0.8248	0.5636	Non-Significant Effect
Error	0.9645474	0.04593083	21			
Total	1.191852		27			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Mod Levene Equality of Variance	0.8729	3.812	0.5311	Equal Variances
Variances	Levene Equality of Variance	7.8	3.812	0.0002	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.6457	0.8975	<0.0001	Non-normal Distribution

7d Survival Rate Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	0.775	0.05895	1	1	0.1	1	0.225	58.06%	22.5%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
25		4	0.95	0.8581	1	0.95	0.9	1	0.02887	6.08%	5.0%
27.1		4	1	1	1	1	1	1	0	0.0%	0.0%
50		4	0.95	0.8581	1	0.95	0.9	1	0.02887	6.08%	5.0%
100		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	2.5%

Angular (Corrected) Transformed Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
6.25		4	1.139	0.272	2.007	1.412	0.3218	1.412	0.2726	47.84%	19.3%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
25		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	5.77%
27.1		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
50		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	5.77%
100		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 2 of 4)
 Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test**New England Bioassay**

Analysis ID: 21-3256-0096 **Endpoint:** 7d Survival Rate
Analyzed: 02 Jun-16 10:31 **Analysis:** Nonparametric-Control vs Treatments **CETIS Version:** CETISv1.8.8
Official Results: Yes

7d Survival Rate Detail

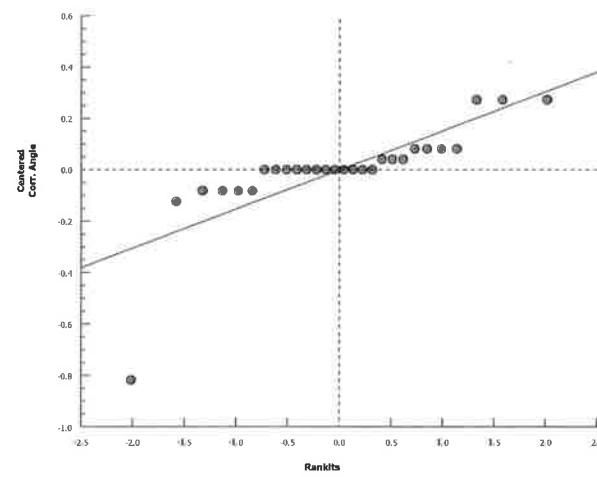
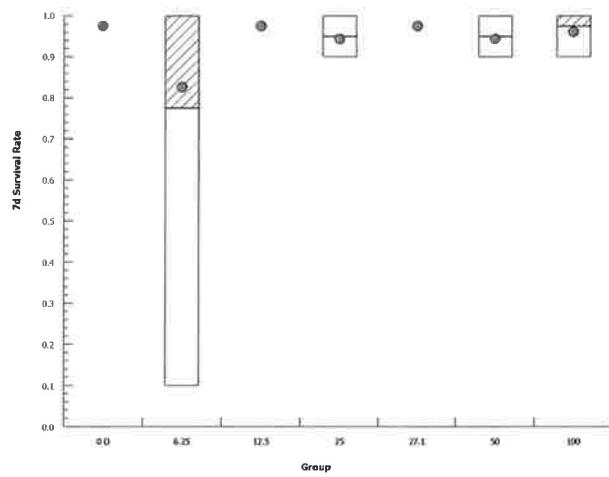
Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
6.25		1	1	1	0.1
12.5		1	1	1	1
25		0.9	1	1	0.9
27.1		1	1	1	1
50		0.9	0.9	1	1
100		0.9	1	1	1

Angular (Corrected) Transformed Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1.412	1.412	1.412	1.412
6.25		1.412	1.412	1.412	0.3218
12.5		1.412	1.412	1.412	1.412
25		1.249	1.412	1.412	1.249
27.1		1.412	1.412	1.412	1.412
50		1.249	1.249	1.412	1.412
100		1.249	1.412	1.412	1.412

7d Survival Rate Binomials

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	1/10
12.5		10/10	10/10	10/10	10/10
25		9/10	10/10	10/10	9/10
27.1		10/10	10/10	10/10	10/10
50		9/10	9/10	10/10	10/10
100		9/10	10/10	10/10	10/10

Graphics

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 3 of 4)
Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID:	13-5056-7525	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.8
Analyzed:	02 Jun-16 10:32	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes
Batch ID:	18-8904-6168	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	16 May-16 13:32	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Laboratory Water
Ending Date:	23 May-16 12:22	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 23h	Source:	In-House Culture	Age:	<24h
Sample ID:	05-2760-8714	Code:	1F72AB8A	Client:	Specialty Minerals, Inc.
Sample Date:	16 May-16 06:43	Material:	Not Applicable	Project:	
Receive Date:	16 May-16 10:44	Source:	Specialty Minerals		
Sample Age:	7h	Station:			

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	27.2%	100	>100	NA	

Steel Many-One Rank Sum Test

Control	vs	Group	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water	6.25		22	10	0	6	0.9934	Asymp	Non-Significant Effect
	12.5		26	10	0	6	1.0000	Asymp	Non-Significant Effect
	25		26	10	0	6	1.0000	Asymp	Non-Significant Effect
	27.1		26	10	0	6	1.0000	Asymp	Non-Significant Effect
	50		25	10	0	6	0.9998	Asymp	Non-Significant Effect
	100		25	10	0	6	0.9998	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	0.06597932	0.01099655	6	1.139	0.3746	Non-Significant Effect
Error	0.2027107	0.009652888	21			
Total	0.26869		27			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Bartlett Equality of Variance	37.98	16.81	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.6663	0.8975	<0.0001	Non-normal Distribution

Mean Dry Biomass-mg Summary

Group	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	0.626	0.5927	0.6593	0.626	0.606	0.646	0.01046	3.34%	0.0%
6.25		4	0.557	0.1588	0.9552	0.6665	0.183	0.712	0.1251	44.93%	11.02%
12.5		4	0.6725	0.64	0.705	0.6635	0.66	0.703	0.01022	3.04%	-7.43%
25		4	0.707	0.64	0.774	0.7165	0.648	0.747	0.02106	5.96%	-12.94%
27.1		4	0.703	0.6449	0.7611	0.717	0.649	0.729	0.01826	5.2%	-12.3%
50		4	0.6612	0.6359	0.6866	0.6585	0.646	0.682	0.007973	2.41%	-5.63%
100		4	0.683	0.6402	0.7258	0.6925	0.645	0.702	0.01344	3.93%	-9.11%

Mean Dry Biomass-mg Detail

Group	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	0.606	0.646	0.642	0.61
6.25		0.664	0.669	0.712	0.183
12.5		0.66	0.662	0.665	0.703
25		0.648	0.722	0.747	0.711
27.1		0.72	0.729	0.714	0.649
50		0.646	0.665	0.682	0.652
100		0.645	0.683	0.702	0.702

CETIS Analytical Report

Report Date: 02 Jun-16 10:32 (p 4 of 4)
Test Code: 16-666b | 19-7961-8961

Fathead Minnow 7-d Larval Survival and Growth Test

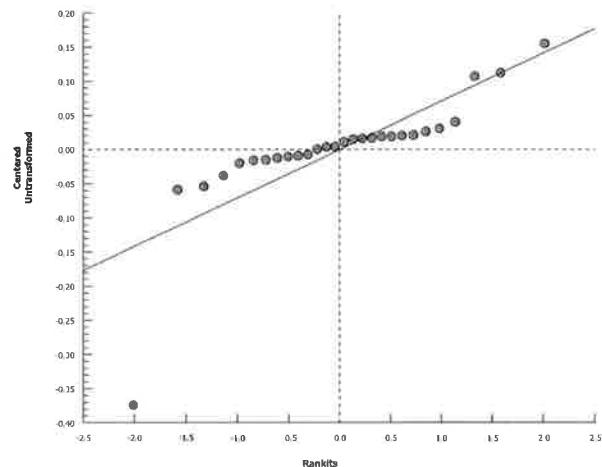
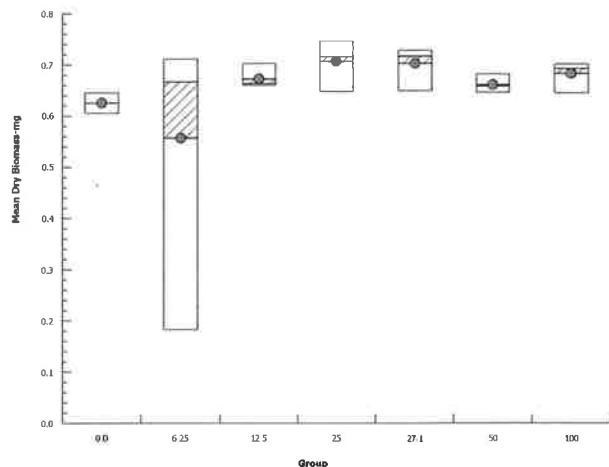
New England Bioassay

Analysis ID: 13-5056-7525
Analyzed: 02 Jun-16 10:32

Endpoint: Mean Dry Biomass-mg
Analysis: Nonparametric-Control vs Treatments

CETIS Version: CETISv1.8.8
Official Results: Yes

Graphics



Concentration	Rep	Final Weight (mg)	Initial Weight (mg)	Total Weight (mg)	Average per fish (mg)	Mean fish weight (mg)	Standard Deviation
NEB Lab Synthetic Diluent	1	935.07	929.01	6.06	0.606	0.6260	0.020912516
	2	935.08	928.62	6.46	0.646		
	3	933.55	927.13	6.42	0.642		
	4	932.62	926.52	6.10	0.610		
Hoosic River Control	1	935.40	929.43	5.97	0.597	0.6122	0.076146241
	2	943.10	937.94	5.16	0.516		
	3	935.25	928.86	6.39	0.639		
	4	943.41	936.44	6.97	0.697		
6.25%	1	941.59	934.95	6.64	0.664	0.5570	0.250262529
	2	945.86	939.17	6.69	0.669		
	3	942.24	935.12	7.12	0.712		
	4	936.37	934.54	1.83	0.183		
12.5%	1	946.40	939.80	6.60	0.660	0.6725	0.020436895
	2	942.86	936.24	6.62	0.662		
	3	941.86	935.21	6.65	0.665		
	4	943.76	936.73	7.03	0.703		
25%	1	942.45	935.97	6.48	0.648	0.7070	0.042118879
	2	945.11	937.89	7.22	0.722		
	3	947.60	940.13	7.47	0.747		
	4	947.75	940.64	7.11	0.711		
27.17%	1	944.12	936.92	7.20	0.720	0.7030	0.036523965
	2	946.89	939.60	7.29	0.729		
	3	942.88	935.74	7.14	0.714		
	4	946.33	939.84	6.49	0.649		
50%	1	945.10	938.64	6.46	0.646	0.6613	0.015945219
	2	944.04	937.39	6.65	0.665		
	3	941.95	935.13	6.82	0.682		
	4	946.13	939.61	6.52	0.652		
100%	1	944.63	938.18	6.45	0.645	0.6830	0.026870058
	2	941.08	934.25	6.83	0.683		
	3	943.07	936.05	7.02	0.702		
	4	945.62	938.60	7.02	0.702		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:		Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220					
NEB PROJECT NUMBER:		05.0044739.00		TEST ORGANISM		<i>Pimephales promelas</i>	
DILUTION WATER SOURCE:		Moderately Hard Synthetic			START DATE:	5/16/16	TIME:
ANALYST	ER	KO	MV	CW	CW	PD	MV
NEB Lab Synthetic Diluent	1	2	3	4	5	6	7
Temp °C	Initial	24.9	24.3	25.5	25.1	25.3	25.2
D.O. mg/L	Initial	8.2	8.4	8.4	8.0	8.4	8.4
pH s.u.	Initial	8.1	7.7	7.8	7.9	7.9	7.8
Conductivity µS	Initial	322	320	321	323	319	320
Temp °C	Final	25.1	25.0	24.9	24.7	25.0	24.6
D.O. mg/L	Final	7.2	7.3	6.9	6.8	7.2	7.4
pH s.u.	Final	7.8	7.6	7.6	7.8	7.8	7.4
Conductivity µS	Final	341	343	341	356	345	344
Hoosic River Control		1	2	3	4	5	6
Temp °C	Initial	24.9	24.5	24.8	24.5	24.5	25.4
D.O. mg/L	Initial	9.9	9.0	9.3	9.2	10.3	9.0
pH s.u.	Initial	8.0	7.7	7.8	7.8	7.8	8.0
Conductivity µS	Initial	256	253	268	272	279	280
Temp °C	Final	25.1	25.1	25.0	24.5	24.9	24.7
D.O. mg/L	Final	7.5	6.8	6.3	7.2	7.6	7.4
pH s.u.	Final	7.8	7.5	7.6	7.9	7.8	7.7
Conductivity µS	Final	279	278	285	296	306	301
6.25%		1	2	3	4	5	6
Temp °C	Initial	24.7	24.9	24.8	25.0	25.2	25.5
D.O. mg/L	Initial	8.3	8.4	9.4	7.9	8.4	8.5
pH s.u.	Initial	8.0	7.9	7.9	8.0	7.9	8.0
Conductivity µS	Initial	335	337	337	345	337	336
Temp °C	Final	25.0	24.7	24.4	25.0	25.0	24.7
D.O. mg/L	Final	6.9	7.2	7.0	7.3	7.4	7.5
pH s.u.	Final	7.7	7.5	7.6	7.8	7.8	7.7
Conductivity µS	Final	353	358	357	364	360	360
12.5%		1	2	3	4	5	6
Temp °C	Initial	24.7	24.8	25.3	25.0	25.3	25.6
D.O. mg/L	Initial	8.3	8.3	8.5	8.0	8.4	8.3
pH s.u.	Initial	8.0	7.9	7.9	8.0	7.9	8.0
Conductivity µS	Initial	351	348	350	352	351	353
Temp °C	Final	24.8	24.7	24.4	24.7	25.0	24.9
D.O. mg/L	Final	7.3	7.0	7.1	7.2	7.1	7.0
pH s.u.	Final	7.8	7.5	7.7	7.9	7.8	7.8
Conductivity µS	Final	374	373	369	374	376	376

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:		Specialty Minerals, Inc., 260 Columbia Street, Adams, MA 01220						
NEB PROJECT NUMBER:		05.0044739.00		TEST ORGANISM		<i>Pimephales promelas</i>		
DILUTION WATER SOURCE:		Moderately Hard Synthetic			START DATE:	5/16/16	TIME: 1332	
25%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	24.9	24.8	25.3	24.9	25.3	25.8	25.7
D.O. mg/L	Initial	8.3	8.4	8.4	8.1	8.3	8.3	8.3
pH s.u.	Initial	7.9	7.9	7.9	8.0	7.8	7.9	8.0
Conductivity µS	Initial	380	377	377	382	383	383	383
Temp °C	Final	25.1	25.0	24.9	24.5	24.8	24.9	25.0
D.O. mg/L	Final	7.2	6.6	6.5	7.4	7.2	6.8	7.1
pH s.u.	Final	7.8	7.5	7.7	7.9	7.9	7.8	7.8
Conductivity µS	Final	397	398	395	404	410	406	398
27.17%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	24.9	24.8	25.4	24.9	25.3	26.0	26.0
D.O. mg/L	Initial	8.3	8.4	8.5	8.1	8.3	8.3	8.3
pH s.u.	Initial	7.9	7.9	7.9	8.0	7.8	7.9	8.0
Conductivity µS	Initial	386	382	382	387	389	390	389
Temp °C	Final	25.1	25.0	25.0	24.5	24.7	24.7	24.9
D.O. mg/L	Final	7.2	6.9	6.4	7.3	7.3	7.3	7.1
pH s.u.	Final	7.8	7.6	7.7	8.0	7.9	7.9	7.9
Conductivity µS	Final	403	406	401	413	424	415	408
50%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	24.9	24.9	25.0	24.7	25.3	26.0	26.0
D.O. mg/L	Initial	8.4	8.4	8.5	8.4	8.3	8.3	8.3
pH s.u.	Initial	7.9	7.8	7.9	8.0	7.8	7.9	8.0
Conductivity µS	Initial	442	439	398	443	451	453	453
Temp °C	Final	24.6	24.6	24.4	24.6	25.0	24.8	25.4
D.O. mg/L	Final	7.5	7.1	6.8	6.9	7.2	7.2	7.0
pH s.u.	Final	8.0	7.7	7.8	8.0	7.9	7.8	7.9
Conductivity µS	Final	464	465	431	460	473	475	467
100%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	25.0	24.4	24.6	24.1	25.2	26.0	26.0
D.O. mg/L	Initial	9.0	8.8	9.0	9.0	8.4	8.5	8.6
pH s.u.	Initial	7.8	7.8	7.8	7.9	7.6	7.7	7.9
Conductivity µS	Initial	566	560	386*	567	588	590	587
Temp °C	Final	25.1	24.9	24.8	25.2	25.1	25.0	25.4
D.O. mg/L	Final	7.0	7.2	6.9	6.9	6.9	6.9	7.2
pH s.u.	Final	8.0	7.9	7.9	8.1	8.0	8.0	7.9
Conductivity µS	Final	579	579	438	575	603	598	580

* Concentration 100% Day 4 mixed incorrectly. Concentrations mixed with water other than Sample 2 Effluent resulting in low conductivity for initial chemistry for this day.- KO 5/19/16

NEW ENGLAND BIOASSAY
INITIAL CHEMISTRY DATA

CLIENT: Specialty Minerals, Inc.
 NEB JOB #: 05.0044739.00
 TEST ID #: C.dubia 16-666a P.promelas 16-666b

DATE RECEIVED	5/16/16		5/18/16		5/20/16	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC #	C36-2038	C36-2039	C36-2061	C36-2062	C36-2083	C36-2084
pH (SU)	7.3	7.5	7.7	7.8	7.1	7.4
Temperature (°C)	3.6	2.8	2.9	2.8	11.0	4.6
Dissolved Oxygen (mg/L)	9.3	10.4	8.2	8.9	9.3	10.5
Conductivity (μmhos)	567	255	569	270	596	280
Salinity (ppt)	<1	<1	<1	<1	<1	<1
TRC - DPD (mg/L)	0.008	0.011	0.004	0.013	0.006	0.005
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as CaCO ₃)	170	94	174	94	184	96
Alkalinity (mg/l as CaCO ₃)	175	75	165	80	180	185
Tech Initials	KO	KO	ER	ER	KO	KO

NOTE: NA = NOT APPLICABLE

Data Reviewed By:

Date Reviewed:



Monday, May 23, 2016

**Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040**

**Project ID: SPECIALTY MINERALS INC
Sample ID#s: BN32849 - BN32852**

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

**NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B**

**NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301**



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 23, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: LK
Analyzed by: see "By" below

Date

Time

05/16/16

6:43

05/16/16

15:56

SDG ID: GBN32849

Phoenix ID: BN32849

Project ID: SPECIALTY MINERALS INC

Client ID: EFFLUENT 1 C36-2038

Laboratory Data

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	< 0.010	0.010	mg/L	1	05/17/16	LK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	05/18/16	MA	SM3113B
Copper	< 0.005	0.005	mg/L	1	05/17/16	LK	E200.7
Hardness (CaCO ₃)	215	0.1	mg/L	1	05/18/16		E200.7
Nickel	< 0.001	0.001	mg/L	1	05/17/16	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	05/17/16	TH	SM3113B
Zinc	< 0.002	0.002	mg/L	1	05/17/16	LK	E200.7
Alkalinity-CaCO ₃	188	5.00	mg/L	1	05/16/16	RWR/KDBSM2320B-97	
Conductivity	549	5.00	umhos/cm	1	05/16/16	RWR/KDBSM2510B-97	
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/20/16	WHM	E350.1
Tot. Diss. Solids	300	10	mg/L	1	05/17/16	KH	SM2540C-97
Tot. Org. Carbon	0.71	0.50	mg/L	1	05/17/16	RR/EG	SM5310C/E415.1-00
Total Solids	320	10	mg/L	1	05/18/16	KH	SM2540B-97
Total Metals Digestion	Completed				05/16/16	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

May 23, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 23, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by: _____
Received by: LK
Analyzed by: see "By" below

Date

Time

05/16/16

6:29

05/16/16

15:56

SDG ID: GBN32849

Phoenix ID: BN32850

Project ID: SPECIALTY MINERALS INC

Client ID: RECEIVING WATER C36-2039

Laboratory Data

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.060	0.010	mg/L	1	05/17/16	LK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	05/18/16	MA	SM3113B
Copper	< 0.005	0.005	mg/L	1	05/17/16	LK	E200.7
Hardness (CaCO ₃)	101	0.1	mg/L	1	05/18/16		E200.7
Nickel	0.004	0.001	mg/L	1	05/18/16	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	05/17/16	TH	SM3113B
Zinc	< 0.002	0.002	mg/L	1	05/18/16	LK	E200.7
Alkalinity-CaCO ₃	86.4	5.00	mg/L	1	05/17/16		RWR/KDBSM2320B-97
Conductivity	246	5.00	umhos/cm	1	05/17/16		RWR/KDBSM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/20/16	WHM	E350.1
pH	7.96	0.10	pH Units	1	05/17/16 00:02	RWR/KDBSM4500-H	B-00
Tot. Org. Carbon	2.3	0.50	mg/L	1	05/17/16	RR/EG	SM5310C/E415.1-00
Total Metals Digestion	Completed				05/16/16	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

May 23, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 23, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: LK
Analyzed by: see "By" below

Date

Time

05/16/16

6:41

05/16/16

15:56

SDG ID: GBN32849

Phoenix ID: BN32851

Project ID: SPECIALTY MINERALS INC
Client ID: EFFLUENT GRAB 1

Laboratory Data

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	05/16/16 17:15	O	SM4500CLG-97
pH	7.88	0.10	pH Units	1	05/17/16 00:10	RWR/KDBSM4500-H B-00	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

May 23, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 23, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: LK
Analyzed by: see "By" below

Date

Time

05/16/16

10:30

05/16/16

15:56

SDG ID: GBN32849

Phoenix ID: BN32852

Laboratory Data

Project ID: SPECIALTY MINERALS INC
Client ID: MHRCF LAB WATER C36-MH006

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.054	0.010	mg/L	1	05/17/16	LK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	05/18/16	MA	SM3113B
Copper	< 0.005	0.005	mg/L	1	05/17/16	LK	E200.7
Hardness (CaCO ₃)	99.0	0.1	mg/L	1	05/18/16		E200.7
Nickel	< 0.001	0.001	mg/L	1	05/17/16	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	05/17/16	TH	SM3113B
Zinc	< 0.002	0.002	mg/L	1	05/17/16	LK	E200.7
Alkalinity-CaCO ₃	64.7	5.00	mg/L	1	05/17/16		RWR/KDBSM2320B-97
Conductivity	312	5.00	umhos/cm	1	05/17/16		RWR/KDBSM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/20/16	WHM	E350.1
pH	8.07	0.10	pH Units	1	05/17/16 00:15	RWR/KDBSM4500-H	B-00
Tot. Org. Carbon	< 0.50	0.50	mg/L	1	05/17/16	RR/EG	SM5310C/E415.1-00
Total Metals Digestion	Completed				05/16/16	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

May 23, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 23, 2016

QA/QC Data

SDG I.D.: GBN32849

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 345786 (mg/L), QC Sample No: BN32547 (BN32849, BN32850, BN32852)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	107			106			75 - 125	20
Lead (Furnace) - Water	BRL	0.001	<0.001	<0.001	NC	104			99.6			75 - 125	30
QA/QC Batch 345789 (mg/L), QC Sample No: BN32753 (BN32849, BN32850, BN32852)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	1.01	1.06	4.80	97.3			112			75 - 125	20
Copper	BRL	0.005	0.052	0.054	3.80	99.1			106			75 - 125	20
Nickel	BRL	0.001	<0.001	0.002	NC	104			102			75 - 125	20
Zinc	BRL	0.002	0.091	0.092	1.10	102			100			75 - 125	20



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 Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 23, 2016

QA/QC Data

SDG I.D.: GBN32849

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 345843 (mg/L), QC Sample No: BN31979 (BN32849)													
Tot. Diss. Solids	BRL	10	51	53	3.80	98.0						85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345876 (mg/L), QC Sample No: BN32328 (BN32849, BN32850, BN32852)													
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	99.0			113			85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345817 (mg/L), QC Sample No: BN32833 (BN32849, BN32850, BN32852)													
Alkalinity-CaCO ₃	BRL	5.00	<20.0	20	NC	97.8						85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345823 (umhos/cm), QC Sample No: BN32833 (BN32849, BN32850, BN32852)													
Conductivity	BRL	5.00	516	515	0.20	97.7						85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345814 (pH), QC Sample No: BN32833 (BN32850, BN32851, BN32852)													
pH			6.37	6.39	0.30	98.7						85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345984 (mg/L), QC Sample No: BN32840 (BN32849)													
Total Solids	BRL	10	800	800	0	101						85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 345776 (mg/L), QC Sample No: BN32842 (BN32851)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	101							
QA/QC Batch 346163 (mg/L), QC Sample No: BN34996 (BN32849, BN32850, BN32852)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	98.9			97.5			85 - 115	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

MS - Matrix Spike

MS Dup - Matrix Spike Duplicate

NC - No Criteria

Intf - Interference

Phyllis Shiller, Laboratory Director
 May 23, 2016

Monday, May 23, 2016

Criteria: None

State: MA

Sample Criteria Exceedences Report

GBN32849 - NEB

Page 1 of 1

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
*** No Data to Display ***								

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

May 23, 2016

SDG I.D.: GBN32849

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823

UICD

Temp 30°C Pg of

Data Delivery (check one):

- Fax #: _____
 Email: kimberly.wills@gza.com

Format: Excel Pdf Gis Key

Client Services (860) 645-8726

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Specialty Minerals, Inc. (MA)

Project P.O: 21729

Report to: Kim Wills

Phone #: 860-643-9560

Invoice to: Kim Wills

Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____

Date _____

Matrix Code:

DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled
32849	Effluent - 1 C36-20358	WW	5/16/16	0632-0643
32850	Receiving Water - 1 C36-20357	O	5/16/16	0629
32851	Effluent grab - 1	WW	5/16/16	0641

32852	MHRCF lab water	O	5/16/16	1030	X X X	X X X	X	1 1 1 1
					C36-MHRCF			

Analysis Request

Hardness (0.5 mg/L)	X														
Alkalinity (2.0 mg/L)	X	X													
Specific Conductance (-)			X	X	X										
Total Solids (-)				X	X	X		X							
Total Dissolved Solids (-)					X	X	X								
Ammonia (0.1 mg/L)						X									
Total Organic Carbon (0.5 mg/L)							X								
Cd (AA), Pb (AA), Cu, Zn, Ni, Al								X							
Total Residual Chlorine (0.02 mg/L)									X						
pH (-)										X					
Soil VOA Vials L)methanol ()Sod Bisulfate											X				
GL Soil container ()oz												X			
PL As Is 250 ml.													X		
PL 120 As Is														X	
GL Amber 120ml ()As Is (X)H2SO4														X	
PL As Is (X)500ml ()1000ml															X
PL H2SO4 (X)125ml ()1000ml															X
PL NaOH 250ml															
Bacteria Bottle															

Relinquished by:

Accepted by:

Date:

5-16-16 1505

Time:

5-16-16 15:50

Turnaround:

- 1 Day*
- 2 Days*
- 3 Days*
- Standard
- Other

* Surcharge Applies

Requirements for CT

- Res. Criteria
- GW Protection
- GA Mobility
- GB Mobility
- SW Protection
- Res. Vol.
- Ind. Vol.

Requirements for MA

- GW-1
- GW-2
- GW-3
- S-1
- S-2
- S-3
- MCP Certification
- Other

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above. Metals MLs are listed below:

Cd - 0.0005 mg/L; Pb - 0.0005 mg/L; Cu - 0.003 mg/L; Zn - 0.005 mg/L; Ni - 0.005 mg/L; Al - 0.02 mg/L

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports



Tuesday, May 24, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: SPECIALTY MINERALS
Sample ID#s: BN34691 - BN34692

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 24, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: SW
Analyzed by: see "By" below

Date

Time

05/18/16

6:37

05/18/16

16:17

SDG ID: GBN34691

Phoenix ID: BN34691

Project ID: SPECIALTY MINERALS
Client ID: EFFLUENT-2 C36-2061

Laboratory Data

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.08	0.05	mg/L	1	05/23/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

May 24, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 24, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: SW
Analyzed by: see "By" below

Date

Time

05/18/16

6:28

05/18/16

16:17

SDG ID: GBN34691

Phoenix ID: BN34692

Laboratory Data

Project ID: SPECIALTY MINERALS
Client ID: RECEIVING WATER-2 C36-2062

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/23/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

May 24, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 24, 2016

QA/QC Data

SDG I.D.: GBN34691

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 346311 (mg/L), QC Sample No: BN34583 (BN34691, BN34692)													
Ammonia as Nitrogen	BRL	0.05	28.4	29.2	2.80	101			92.0			85 - 115	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

MS - Matrix Spike

MS Dup - Matrix Spike Duplicate

NC - No Criteria

Intf - Interference

Phyllis Shiller, Laboratory Director
May 24, 2016

Tuesday, May 24, 2016

Criteria: None

State: MA

Sample Criteria Exceedences Report

GBN34691 - NEB

Page 1 of 1

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
*** No Data to Display ***								

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Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

May 24, 2016

SDG I.D.: GBN34691

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



Thursday, May 26, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: SPECIALTY MINERALS MA
Sample ID#s: BN36574 - BN36575

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in cursive ink that reads "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 26, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: LK
Analyzed by: see "By" below

Date

05/20/16 6:40

05/20/16 14:06

SDG ID: GBN36574

Phoenix ID: BN36574

Project ID: SPECIALTY MINERALS MA
Client ID: EFFLUENT 3 C36-2083

Laboratory Data

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/25/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

May 26, 2016

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

May 26, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21729

Custody Information

Collected by:
Received by: LK
Analyzed by: see "By" below

Date

Time

05/20/16 6:19
05/20/16 14:06

SDG ID: GBN36574
Phoenix ID: BN36575

Laboratory Data

Project ID: SPECIALTY MINERALS MA
Client ID: RECEIVING WATER C36-2084

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	05/25/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

May 26, 2016

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

May 26, 2016

QA/QC Data

SDG I.D.: GBN36574

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 346630 (mg/L), QC Sample No: BN36304 (BN36574, BN36575)													
Ammonia as Nitrogen		BRL	0.05	<0.05	<0.05	NC	98.0		101			85 - 115	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference

LCS - Laboratory Control Sample

LCSD - Laboratory Control Sample Duplicate

MS - Matrix Spike

MS Dup - Matrix Spike Duplicate

NC - No Criteria

Intf - Interference

Phyllis Shiller, Laboratory Director

May 26, 2016

Thursday, May 26, 2016

Criteria: None

State: MA

Sample Criteria Exceedences Report

GBN36574 - NEB

Page 1 of 1

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
*** No Data to Display ***								

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Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

May 26, 2016

SDG I.D.: GBN36574

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



CHAIN OF CUSTODY RECORD

Customer: New England Bioassay
 Address: 77 Batson Drive
 Manchester, CT 06042

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
 Email: service@phoenixlabs.com Fax (860) 645-0823

Client Services (860) 645-8726

Project: Specialty Minerals (mp)

Report to: Kim Wills

Invoice to: Kim Wills

Pg of
 Temp 4 °C Ice\Blue Ice/ No Coolant
Data Delivery (check one):
 Fax #: _____
 Email: kimberly.wills@gza.com
 Format: Excel Pdf Gis Key

Project P.O.: 21729
 Phone #: 860-643-9560
 Fax #: 860-646-7169

Client Sample - Information - Identification

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)												
					Sil. VOA Vials ()	methanol ()	Sod Bisulfate	oz	Gt. Soil container ()	As Is 500 ml	As Is 120ml	As Is 250ml ()	As Is 1000ml	H2SO4 1 X 1250ml ()	HNO3 1 X 1250ml ()	NaOH 250ml ()	Bacteria Bottles
36574	Effluent-3C6-2083	WW	5/20/16	0631-0640	X												1
36575	Receiving Water-32084	O	5/20/16	0619	X												1

Relinquished by:

Accepted by:

5-20-16 1830
 5-20-16 14:06

Date:

Time:

Turnaround:

- 1 Day*
- 2 Days*
- 3 Days*
- Standard
- Other

* Surcharge Applies

Requirements for CT

- Res. Criteria
- GW Protection
- GA Mobility
- GB Mobility
- SW Protection
- Res. Vol.
- Ind. Vol.

Requirements for MA

- GW-1
- GW-2
- GW-3
- S-1
- S-2
- S-3
- MCP Certification
- Other

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

EFFLUENT

Sample Set #1

Sampler: Peter Cardinal
 Title: Environmental Tech
 Facility: Specialty Minerals, Inc.

Sampling Method: Composite

Sample ID: Outfall 001
 Start Date: 5-15-2016 Time: 6:32 AM
 End Date: 5-16-2016 Time: 6:43 AM

Sampling Method: Grab (for pH and TRC only)

Date Collected: 5-16-2016
 Time Collected: 6:41 AM

Sample Type: _____
 Prechlorinated
 Dechlorinated
 Unchlorinated
 Chlorinated

Effluent Sampling Location and Procedures:Receiving Water Sampling Location and Procedures:

Requested Analysis: Chronic and modified acute

Sample Shipment

Method of Shipment:	NEB Courier	
Relinquished By:	<u>Peter Cardinal</u>	Date: <u>5-16-16</u> Time: <u>0822</u>
Received By:	<u>Michele Hoffer</u>	Date: <u>5-16-16</u> Time: <u>0822</u>
Relinquished By:	<u>Michele Hoffer</u>	Date: <u>5-16-16</u> Time: <u>1044</u>
Received By:	<u>Karen J. Smith</u>	Date: <u>5-16-16</u> Time: <u>1044</u>

Optional Information

Purchase Order # to reference on invoice: _____

FOR NEB USE ONLY

* Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.

Temperature of Effluent Upon Receipt at Lab: 3.6 °C

Effluent COC# C36 2038

Temperature of Receiving Water Upon Receipt at Lab: 2.8 °C

Receiving Water COC# C36 2039

**IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
 KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042**

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY**EFFLUENT**

Sample Set # 2

Sampler: Peter Cardinal
 Title: Environmental Tech
 Facility: Specialty Minerals, Inc.

Sampling Method: CompositeSample ID: Outfall 001Start Date: 5-17-2016 Time: 6:24 AMEnd Date: 5-18-2016 Time: 6:37 AM**Sampling Method:** Grab (for pH and TRC only _____)Date Collected: NA

Time Collected: _____

Sample Type: _____
 Prechlorinated
 Dechlorinated
 Unchlorinated
 Chlorinated

Effluent Sampling Location and Procedures:SMI Outfall 001- Isco 24 hr Composite Sampler**Receiving Water Sampling Location and Procedures:**Lime Street Bridge- Hoosic River - Grab.**Requested Analysis:** Chronic and modified acute**Sample Shipment**Method of Shipment: NEB CourierRelinquished By: DCD Date: 5-18-16 Time: 0817Received By: Mike Hodder Date: 5-18-16 Time: 0817Relinquished By: Mike Hodder Date: 5-18-16 Time: 1213

Received By: _____ Date: _____ Time: _____

Optional Information

Purchase Order # to reference on invoice: _____

FOR NEB USE ONLY

* Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.

Temperature of Effluent Upon Receipt at Lab: 2.9 °CTemperature of Receiving Water Upon Receipt at Lab: 2.8 °CEffluent COC# C36 - 2061Receiving Water COC# C36 - 2062

**IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
 KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042**

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

EFFLUENT

Sampler: Peter Cardinal
 Title: Environmental Tech
 Facility: Specialty Minerals, Inc.

Sample Set # 3Sampling Method: CompositeSample ID: Outfall 001Start Date: 5-19-2016 Time: 6:31 AMEnd Date: 5-20-2016 Time: 6:40 AMSampling Method: Grab (for pH and TRC only)Date Collected: NA

Time Collected: _____

Sample Type: _____
 Prechlorinated
 Dechlorinated
 Unchlorinated
 Chlorinated

Effluent Sampling Location and Procedures:SMI Outfall 001 - Isco 24 hr Composite SamplerReceiving Water Sampling Location and Procedures:Lime Street Bridge - Hoosic River - GrabRequested Analysis: Chronic and modified acuteSample ShipmentMethod of Shipment: NEB CourierRelinquished By: P.C.D.Date: 5-20-16Time: 0740Received By: DDGDate: 5-20-16Time: 0740Relinquished By: DDGDate: 5-20-16Time: 1015Received By: R.SimoneDate: 5/20/16

Time: _____

Optional Information

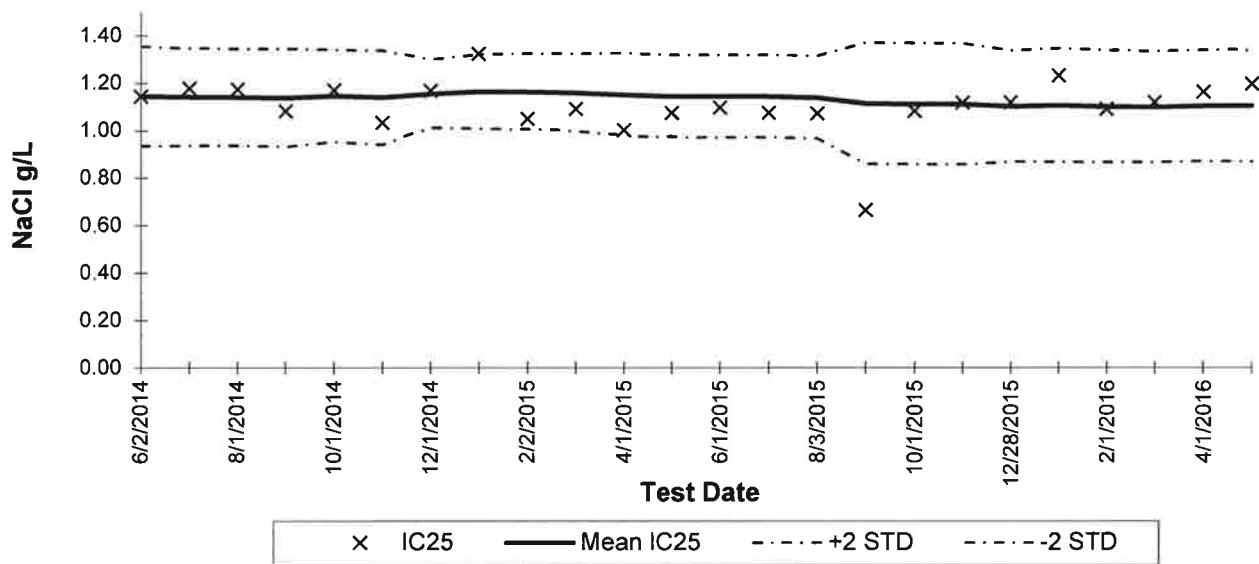
Purchase Order # to reference on invoice: _____

FOR NEB USE ONLY*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**Temperature of Effluent Upon Receipt at Lab: 11.0 °CTemperature of Receiving Water Upon Receipt at Lab: 4.6 °CEffluent COC# C36-2083Receiving Water COC# C36-2084

**IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
 KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042**

New England Bioassay
Reference Toxicant Data: Ceriodaphnia dubia Chronic Reproduction IC25

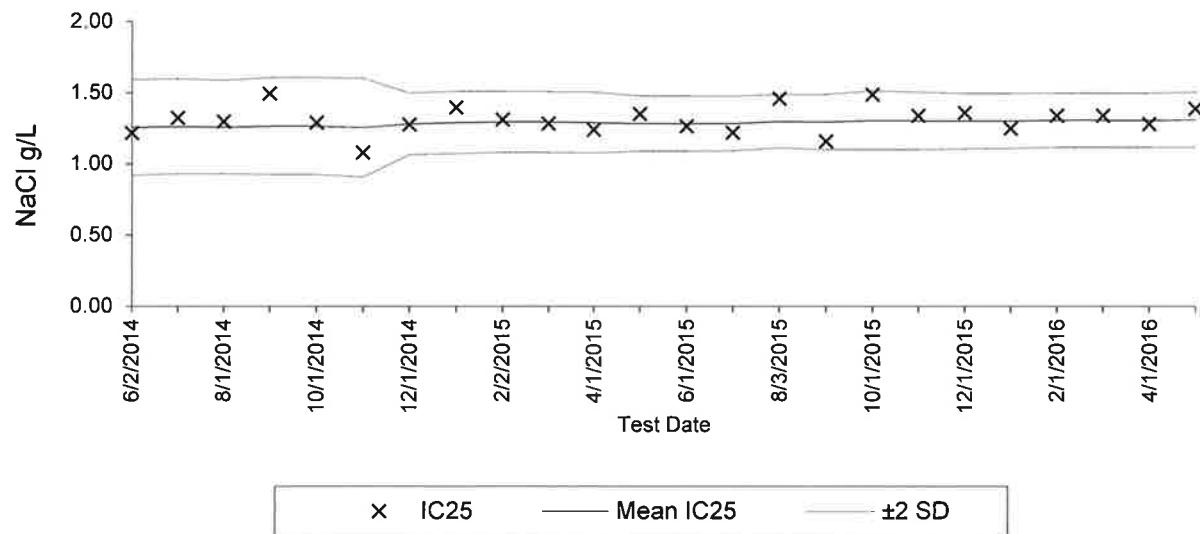
Reference Toxicant: Sodium chloride
Test Dates: June 2014 - May 2016



Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	CV National		
							CV	75th%	90th%
14-913	6/2/2014	1.15	1.15	0.11	0.94	1.36	0.09	0.45	0.62
14-1016	7/1/2014	1.18	1.14	0.10	0.94	1.35	0.09	0.45	0.62
14-1202	8/1/2014	1.18	1.14	0.10	0.94	1.35	0.09	0.45	0.62
14-1426	9/2/2014	1.08	1.14	0.10	0.93	1.35	0.09	0.45	0.62
14-1629	10/1/2014	1.17	1.15	0.10	0.95	1.34	0.08	0.45	0.62
14-1886	11/3/2014	1.03	1.14	0.10	0.94	1.34	0.09	0.45	0.62
14-1982	12/1/2014	1.17	1.15	0.07	1.01	1.30	0.06	0.45	0.62
15-79	1/5/2015	1.32	1.16	0.08	1.01	1.32	0.07	0.45	0.62
15-148	2/2/2015	1.05	1.16	0.08	1.00	1.32	0.07	0.45	0.62
15-378	3/23/2015	1.09	1.16	0.08	1.00	1.32	0.07	0.45	0.62
15-460	4/1/2015	1.00	1.15	0.09	0.98	1.32	0.08	0.45	0.62
15-602	5/1/2015	1.07	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-750	6/1/2015	1.10	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-955	7/1/2015	1.07	1.14	0.09	0.97	1.32	0.07	0.45	0.62
15-1211	8/3/2015	1.07	1.14	0.09	0.97	1.31	0.08	0.45	0.62
15-1375	9/9/2015	0.66	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1540	10/1/2015	1.08	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1691	11/2/2015	1.12	1.11	0.13	0.86	1.36	0.11	0.45	0.62
15-1897	12/28/2015	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-37	1/4/2016	1.23	1.11	0.12	0.87	1.34	0.11	0.45	0.62
16-138	2/1/2016	1.09	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-307	3/1/2016	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-463	4/1/2016	1.16	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-596	5/2/2016	1.19	1.10	0.12	0.87	1.34	0.11	0.45	0.62

New England Bioassay
Reference Toxicant Data: *Pimephales promelas* 7-day Chronic Growth IC₂₅

Reference Toxicant: Sodium chloride
Test Dates: June 2014 - May 2016



Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	CV	CV National	CV National
								75th	90th
14-914	6/2/2014	1.22	1.26	0.17	0.92	1.59	0.13	0.38	0.45
14-1061	7/1/2014	1.32	1.26	0.17	0.93	1.60	0.13	0.38	0.45
14-1231	8/1/2014	1.30	1.26	0.16	0.93	1.59	0.13	0.38	0.45
14-1427	9/2/2014	1.49	1.27	0.17	0.92	1.61	0.13	0.38	0.45
14-1630	10/1/2014	1.29	1.27	0.17	0.93	1.61	0.13	0.38	0.45
14-1887	11/3/2014	1.08	1.25	0.17	0.91	1.60	0.14	0.38	0.45
14-2051	12/1/2014	1.28	1.28	0.11	1.07	1.50	0.08	0.38	0.45
15-80	1/5/2015	1.39	1.29	0.11	1.07	1.51	0.08	0.38	0.45
15-149	2/2/2015	1.31	1.30	0.11	1.08	1.51	0.08	0.38	0.45
15-255	3/2/2015	1.28	1.29	0.11	1.08	1.51	0.08	0.38	0.45
15-461	4/1/2015	1.24	1.29	0.11	1.08	1.50	0.08	0.38	0.45
15-604	5/1/2015	1.35	1.28	0.10	1.09	1.48	0.08	0.38	0.45
15-803	6/1/2015	1.27	1.28	0.10	1.09	1.48	0.08	0.38	0.45
15-956	7/1/2015	1.22	1.28	0.10	1.09	1.48	0.07	0.38	0.45
15-1212	8/3/2015	1.46	1.30	0.09	1.11	1.49	0.07	0.38	0.45
15-1376	9/9/2015	1.16	1.29	0.10	1.10	1.49	0.08	0.38	0.45
15-1541	10/1/2015	1.49	1.31	0.10	1.10	1.51	0.08	0.38	0.45
15-1742	11/2/2015	1.34	1.30	0.10	1.10	1.50	0.08	0.38	0.45
15-1881	12/1/2015	1.36	1.30	0.10	1.10	1.50	0.08	0.38	0.45
16-36	1/4/2016	1.25	1.30	0.10	1.11	1.49	0.07	0.38	0.45
16-139	2/1/2016	1.34	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-308	3/1/2016	1.34	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-464	4/1/2016	1.28	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-597	5/2/2016	1.39	1.31	0.10	1.12	1.50	0.07	0.38	0.45